IEEE Student Branch of the UAB

Open Project Space (OPS)

Course Program 2025 - 2026

Lead Instructors: [To be decided]
Lab Supervisor: [To be decided]
Lab Instructors: [To be decided]

1. Course Description

Open Project Space (OPS) is a year-long technical course focused on embedded systems. The objective is to introduce engineering students to topics relevant to their education and future professional careers: integrated circuits, use of protoboards, soldering, microcontrollers, embedded systems programming with C++, hardware communication, and PCB design.

Unlike a traditional university course, we aim to foster participation through project-based learning. Participants will individually complete a series of projects that encapsulate the topics of the program, culminating in a final end-of-course project where they will design and build a remote-controlled rover vehicle.

2. Enrollment Requirements

Undergraduate students of the Universitat Autònoma de Barcelona may apply for enrollment. The deadline for application submission is **October 5, 2025, at 23:59h**. Submitting an application does not guarantee acceptance into the program. Students who receive an offer of acceptance must pay the registration fee and the security deposit before finalizing their enrollment.

3. Registration Fee and Security Deposit

A total of **€20** must be paid at the beginning of the program, which is broken down as follows:

- **€20 Security Deposit (refundable):** Acts as a guarantee deposit.

In return, you will receive a complete component kit that you can keep. The security deposit will be returned as follows: **€10** will be refunded upon satisfactory completion of the required projects for the first semester, and another **€10** upon completion of those for the second semester. Thus, upon finishing the course and having completed all mandatory projects, the entire security deposit will have been recovered.

4. Kit Component List

● 9V Connector (x1)	● Wooden Board, 10x10cm (x1)
● ESP32-C6-DevKitC-1 v1.2 (x2)	● LCD 16x2 + I²C (x1)
● USB-A to USB-C Cable (x1)	● Assorted color LEDs (x9)
● Caster wheel (x1)	● RGB LED (x1)
● Caster wheel chassis (x1)	● Micro SD Card, 1GB (x1)
● Battery, 9V (x2)	● Micro SD Adapter (x1)
● 3D Printed Battery Holder (x1)	● MP3 Player Module (x1)
● Protoboard, 400-point (x2)	● NE555P Integrated Circuit (x2)
● Piezo Buzzer 1.5V (x2)	● Photoresistor 5528 (x1)
● Ceramic Capacitors (0.1uF, 10uF, 1uF)	● Potentiometer (x3)
● Custom PCB (x1)	● 555 Piano PCB (x1)
● AHT20 Temp & Humidity Sensor (x1)	● Resistors of various values
● DIP8 Socket (x1)	● Push Buttons (x5)
● Dupont Jumper Wires (M-F) (x20)	● Slide Switch (x2)
● Motor with Gearbox and Wheel (x2)	● Storage Box (x1)
● Female Headers (pin strips)Joystick (x1)	● Micro Servo (5V) (x1)
● Jumper Wire Kit (140 Pcs) (x1)	● TM1637 7-Segment Display (x1)
● L293D Integrated Circuit (x1)	● Program T-shirt (x1)

5. Course Projects

Projects are assigned approximately every two weeks, and their due date is usually two weeks after their assignment.

First Semester (October - February)

Project	Topics	Description
Let There Be Light (Week 3)	Circuits, Voltage, Current, Ohm's Law, Protoboard, Soldering.	Build and solder a basic LED circuit with a switch on a perfboard.
555 Piano (Week 5)	Circuit Analysis, Nodes, Multimeters, ICs, 555 Timer.	Create an electronic piano with the 555 integrated circuit and solder it to a PCB.
RGB LED Wizard (Week 7)	Microcontrollers, ESP32, Arduino IDE, PWM.	Build and program a dimmable RGB LED using the ESP32 and potentiometers.
Sundial (Week 9)	Arduino Libraries, Servos, Sensors.	Build a device that measures the room's brightness with a photoresistor and a micro servo.

Second Semester (March - June)

Project	Topics	Description
iPoduino v.3.0 (Week 1)	Computer Architecture, UART, PWM.	Build and program a music player with the ESP32, customized for your songs.
Weather Station (Week 3)	I2C and SPI Communication.	Build a station that wirelessly transmits temperature and humidity data to a screen.
Digital Stopwatch (Week 5)	Interrupts and Timers.	Create a digital stopwatch using interrupts, timers, and a 7-segment display.

PCB Design (Week 7) (Optional)	KiCad, Schematics, PCB Design.	Design the PCB for the remote control that will be used to control the final Rover.
Final Project: RC Rover	Integration of all knowledge.	Build and remotely control a rover with a custom PCB.

6. Enrollment Agreement and Program Rules

By signing this document, the participant agrees to the following terms and conditions:

1. **Payment:** The participant agrees to pay the €20 fee to receive the materials and access the content of the OPS program.
2. **Security Deposit Refund:** The full refund of the security deposit (€20) is conditional upon the satisfactory completion and submission of all mandatory projects within the deadlines established for each semester. Failure to meet the deadlines for a semester may result in the loss of the proportional part of the security deposit.
3. **Withdrawal from the Program:** If the participant decides to withdraw from the program, they may request the return of the project kit and the proportional security deposit (if applicable) only until the end of the first semester. The course fee is non-refundable under any circumstances.
4. **Code of Conduct:** All participants are expected to maintain respectful and appropriate behavior. Any conduct that violates the UAB code of conduct or the association's statutes, including the misuse of materials or facilities, may result in expulsion from the program without the right to a refund of the fee or the security deposit.

7. Acknowledgment of Risks and Safety Rules

The participant declares they understand and accept the following:

1. **Inherent Risks:** The program's activities, such as soldering electronic components and handling tools and electricity, involve inherent risks.
2. **Compliance with Rules:** The participant agrees to follow at all times the safety instructions, protocols, and guidelines provided by the program's instructors and

supervisors.

3. **Liability:** The organization will not be held responsible for damages or injuries resulting from the participant's failure to comply with the established safety rules. This does not exclude the organization's liability for its own negligence. The use of provided protective equipment is mandatory.

8. Personal Data Protection (GDPR and LOPDGDD)

In accordance with Regulation (EU) 2016/679 General Data Protection Regulation (GDPR) and Organic Law 3/2018, of December 5, on the Protection of Personal Data and guarantee of digital rights (LOPDGDD), we inform you:

- **Data Controller:** IEEE Student Branch of the UAB, with address at uab.ieee.cat. Contact email: uab@ieee.cat .
- **Purpose:** The personal data collected (name, signature, contact information) will be processed for the sole purpose of managing your enrollment, course-related communication, payment administration, and project submission tracking.
- **Legal Basis:** The processing of your data is based on the execution of this enrollment agreement.
- **Data Retention:** Your data will be kept for the duration of your participation in the program and, subsequently, for the time necessary to comply with legal obligations.
- **Rights:** You may exercise your rights of access, rectification, erasure, objection, and restriction of processing by writing to the data controller at the contact email provided.

9. Image Rights

The participant authorizes the IEEE Student Branch of the UAB to take photographs and/or record videos during the activities of the OPS program. This material may be used for informational and promotional purposes, including, but not limited to, its publication on the official website, social networks (such as Instagram), and other communication materials of the association.

This authorization is granted voluntarily and free of charge, and the participant understands that the transfer of these image rights will not result in any remuneration. The participant may

revoke this consent at any time by sending a written communication to the data controller.

10. Applicable Law and Jurisdiction

This agreement shall be governed by and construed in accordance with Spanish law. For the resolution of any dispute that may arise in relation to this agreement, the parties expressly submit to the jurisdiction of the Courts and Tribunals of the city of Barcelona, waiving any other jurisdiction that may correspond to them.

11. Signature Page

Image Consent:

Check this box to give your explicit consent:

[   ] I authorize the use of my image for the purposes and under the conditions described in clause 9, "Image Rights".

I, the undersigned, declare that I have read, understood, and accepted all the terms and conditions set forth in this document.

Participant's Full Name (in capital letters):
Participant's Signature:
Date: ____ / ____ / _____

If the participant is under 18 years of age, a parent or legal guardian must sign below:
I, as the parent/legal guardian of the participant, authorize their participation in the program and accept the terms and conditions on their behalf.
Parent/Guardian's Full Name (in capital letters):
Parent/Guardian's Signature:
Date: ____ / ____ / _____